3

Identification and understanding of the natural and cultural heritage

3.1 What's in this chapter?

This chapter reports on the performance of management in achieving the World Heritage management obligation of identifying the natural and cultural heritage. This obligation recognises that managers need to know what is there, and—to some extent—how it works, in order to effectively protect, conserve and present the natural and cultural heritage.

Contents

At a glance…key findings of this chapter

Significant new values were discovered in the TWWHA over the 1992–1999 period including a unique bottom-dwelling marine community in Bathurst Harbour–Bathurst Channel and several new species of plants and animals (including a new vertebrate species—the moss froglet). Significant findings were also revealed through genetic research. (See Section 3.2.1 'Discoveries of significant new values').

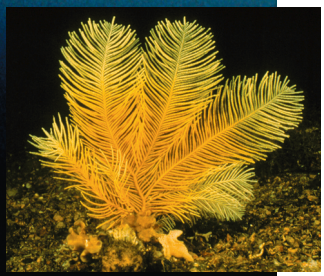
Detailed vegetation maps were produced for more than half the TWWHA (see Section 3.2.2 'Vegetation mapping').

The level of knowledge and understanding of the natural and cultural values of the TWWHA significantly increased as a result of directed research and surveys, including vegetation mapping; fire research; geomorphological surveys; taxonomic and genetic research on plants, animals and diseases; Aboriginal and historic heritage surveys and other research projects. Surveys revealed that several species listed under the Tasmanian *Threatened Species Protection Act* were more widely distributed and/or abundant than previously known, and this led to them being de-listed or downgraded. (See Section 3.3 'Knowledge of the natural and cultural values').

Understanding of how local communities value and use the TWWHA increased as a result of a project that investigated the established (or 'traditional') practices in the area. Understanding of Aboriginal values and interests in the cultural material contained within the TWWHA also increased (see Section 3.4 'Social and cultural values affecting management').

The level of knowledge required for sound management of the TWWHA is considered by the managing agency to be generally adequate in most respects. However, natural and cultural heritage specialists identified a number of areas where a lack of knowledge is limiting or hampering management of the TWWHA (see Section 3.5 'Adequacy of knowledge for sound management').

BATHURST HARBOUR
Below: This unique community of bottom-dwelling sea pens in Bathurst Harbour was one of the significant discoveries made in the Tasmanian Wilderness during the term of the first management plan. This species of sea pen, which is a colonial invertebrate, normally lives at much greater depths off shore but can also live in the shallow dark tannin-stained waters of Bathurst Channel.



Right: Cnidaria: Hexacorallia, Zoanthidae. Forester Point, 5–15 m.

Far right: Cnidaria: Octocorallia, Isididae, Nov.gen. plumacea. Bathurst Channel, south point of Sarah Island, on rock, 5–12m.

3.2 Identification and definition of the natural and cultural values

Key Desired Outcome addressed in this section:

KDO 2.1: Definition, identification and, as necessary, updating of the World Heritage and other natural and cultural values of the World Heritage Area, in particular the area's values of world heritage significance.

The discovery of the moss froglet—a vertebrate species previously unknown to science—was one of the significant new values identified in the TWWHA during the 1992–1999 period.

Photo by Mike Driessen

3.2.1 Discoveries of significant new values

A number of significant new values were discovered within the TWWHA over the 1992–1999 period, including:

- Unique marine bottom-dwelling communities were discovered in Bathurst Harbour–Bathurst Channel. These communities, which are considered to be ecologically unique and of national significance, include plate and encrusting sponges, lace and soft corals, sea squirts, anemones, and lace and fan bryozoans. These discoveries built on the findings of earlier scientific surveys of Port Davey–Bathurst Harbour which included the discovery of a previously unknown species of skate (*Dipturus* sp.).
- Several new species of animals and plants were discovered within the TWWHA, including a new vertebrate species (the moss froglet (*Bryobatrachus nimbus*)), a fern ally (*Isoetes* sp.), a new lichen and many invertebrates. These are scientifically significant findings.
- Genetic research into the plant *Lomatia tasmanica* revealed that it is a sterile triploid clone of considerable significance to science—it appears to have been in existence as a sterile clone for at least 43,000 years, making it the oldest documented vascular plant clone in the world.
- The coastal sandy dune systems in southwest Tasmania, which are some of the least disturbed dune areas in southeastern Australia, were recognised as being of national significance. This stretch of essentially pristine, high-energy temperate coastline is one of only a few comparable coastlines in the world where natural sandy coastal processes can continue undisturbed by modern human activities. Importantly, reservation status of the TWWHA ensures their continued protection.
- The entire Port Davey–Bathurst Harbour embayment was recognised as having outstanding natural values, including:
  - the embayment is the only large undisturbed estuarine system in Southern Australia which has not experienced significant human impact;
  - the entire Davey and Bathurst catchments are free of introduced fish;
  - the waters of Bathurst Harbour are extraordinarily low in nutrient levels.

Genetic research revealed that King's holly (*Lomatia tasmanica*) is of considerable significance to science—it appears to have been in existence as a sterile triploid clone for at least 43,000 years, making it the oldest documented vascular plant clone in the world. *Lomatia tasmanica* occurs only in the Tasmanian Wilderness World Heritage Area.

Photo by DPIWE

This cushion plant moth is one of many new species of invertebrates recently discovered in the Tasmanian Wilderness World Heritage Area.

Photo © CSIRO Division of Entomology.

3.2.2 Vegetation mapping

Over the 1992–1999 period, detailed vegetation maps were produced for more than half of the TWWHA (see Figure 6). Maps were completed for the Cradle Mountain, Walls of Jerusalem, and Central Plateau areas; most of the eastern boundary of the TWWHA was mapped; and maps for the Wild Rivers National Park and Hartz Mountains National Park were mostly completed. Maps of the sensitivity of vegetation communities to trampling damage in some areas were also produced.

In all, sixty-one 1:25,000 vegetation maps were produced with a further twenty-four 1:25,000 maps in the production phase. These vegetation maps have been digitised and can be accessed on the GIS website at: <www.gisparks.tas.gov.au>.

The Southwest National Park is the last extensive area of the TWWHA not to be mapped. Much of this area lacks topographic base maps, and represents the most remote and difficult places to access.

Sib Corbett (Project Officer, WHA Vegetation) has been responsible for mapping the vegetation of the Tasmanian Wilderness World Heritage Area since 1991. During this period, detailed vegetation maps have been produced for more than half of the TWWHA.

Photo by Tina Terry

Left: Mapping alpine herbfields on the slopes of Pelion East. These communities are quite restricted, having their best expression among sandstone cliffs in the central part of Cradle Mountain–Lake St Clair National Park. Detailed knowledge about the distribution of plant communities helps inform a variety of management purposes.

Photo by Sib Corbett

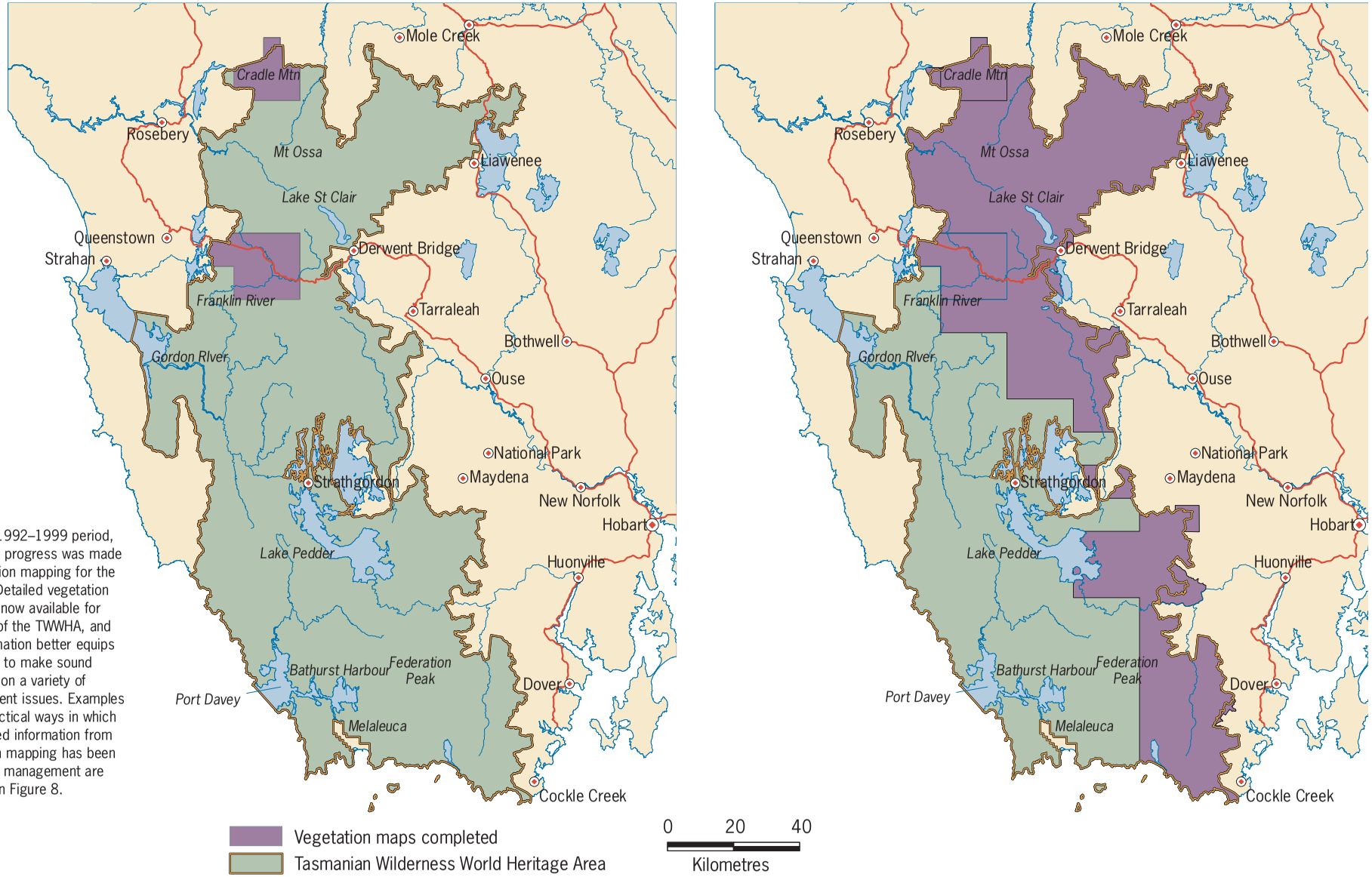
Below: Flowering *Leptospermum nitidum* in scrub communities beside the Mt McCall Track. Buttongrass moorlands and scrub characterise the fire prone ridgetops, while the protected gullies support Eucalypts and rainforest communities.

Photo by Glenys Jones

Figure 6 Progress in vegetation mapping, 1992–2000

1 Vegetation maps at the beginning of the management period (1992)

2 Vegetation maps at the end of the management period (2000)



Over the 1992–1999 period, significant progress was made in vegetation mapping for the TWWHA. Detailed vegetation maps are now available for over half of the TWWHA, and this information better equips managers to make sound decisions on a variety of management issues. Examples of the practical ways in which the detailed information from vegetation mapping has been applied to management are provided in Figure 8.

Figure 7

Major vegetation types in the TWWHA

There are two major vegetation types in the TWWHA and these largely correspond to the major rock types.
In the eastern half, the mountain ranges and gently sloping Central Plateau are dominated by dolerite, and the soils are characterised by relatively high nutrient levels. These soils support tall forests in the lowland areas and shrubby montane heaths in the higher altitude areas.
In the western half, the area is largely underlain by deformed quartzite and is characterised by low soil nutrient levels. The dominant vegetation community is buttongrass moorland. Forests are more restricted and generally consist of rainforest in the most protected areas. These rainforest communities contain many ancient species that date back to the time of the supercontinent Gondwana. The rainforests are often surrounded by Smithton peppermint (*Eucalyptus nitida*) forests and scrub.

Sources: This map has been generated from a simplification of vegetation maps from two sources. The information for the area outside the TWWHA and the western part of the TWWHA has been sourced from the 1: 500,000 map 'Vegetation of Tasmania' by Kirkpatrick & Dickinson 1984. The information for the northern and eastern parts of the TWWHA has been sourced from the considerably more detailed 1:25,000 vegetation maps produced as part of the management program for the TWWHA by the WHA Vegetation Mapping Project, Nature Conservation Branch, DPIWE.

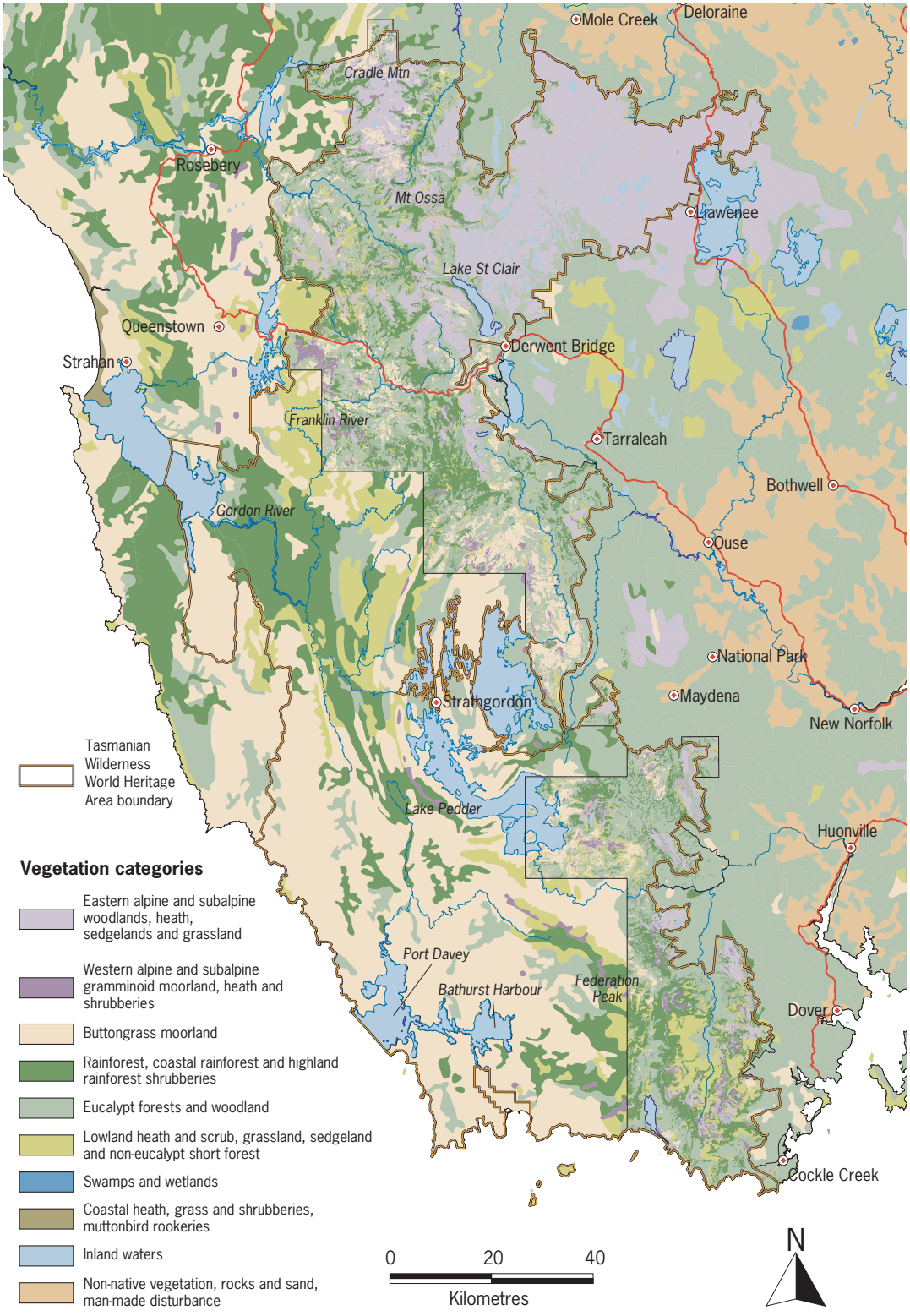
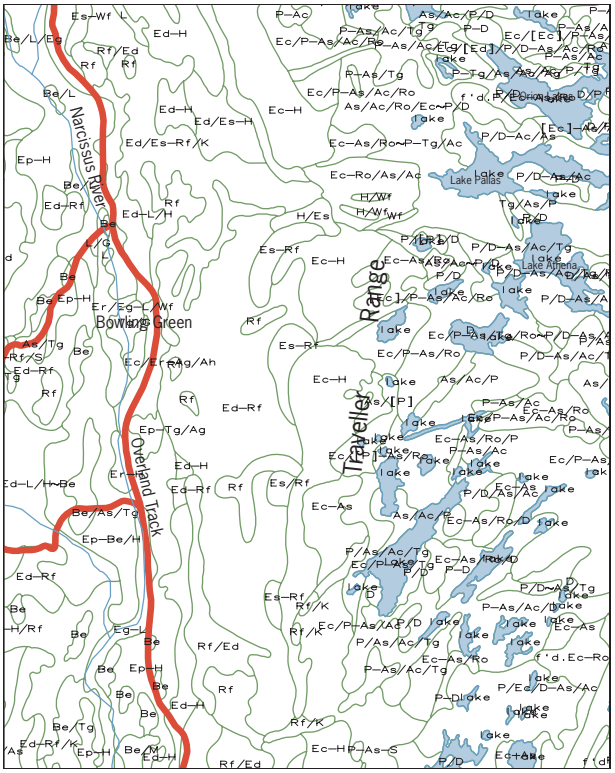


Figure 8

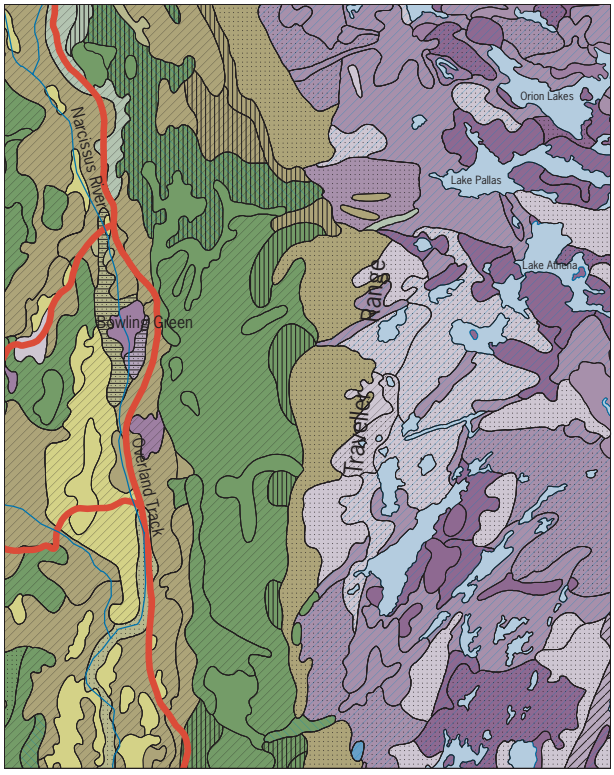
Application of vegetation mapping to management



(a) Original Vegetation Map

This map provides the fundamental detailed information about what plant communities occur where in an area. Each polygon represents a single vegetation community made up of one or more mapping units. In this example, the communities include rainforest (Rf), Pencil Pine (P), *Eucalyptus coccifera* canopy over alpine heath (Ec—As), *Eucalyptus delegatensis* mixed with wet tea tree scrub (Ed/Wf) etc. Information about the vegetation is determined by interpreting 1:25,000 scale aerial photographs and conducting field visits to verify the identifications in representative areas. The vegetation data are stored in a Geographic Information System (GIS) which allows subsequent manipulation to produce maps for specific purposes. This and the following maps depict the same area in the Traveller Range and Narcissus Valley in the Cradle Mountain–Lake St Clair National Park. The location of the red tracks and blue waterways will assist comparison between maps.

Source: Sib Corbett, Resource Management and Conservation, DPIWE



(b) Simplified Vegetation Map

In this map, the complexity of the vegetation communities shown in (a) has been simplified into a small number of broad vegetation categories. The solid colours represent the basic vegetation type (e.g. rainforest, moorland, alpine vegetation, subalpine and lowland vegetation etc) while the hatched pattern refers to the type of canopy (e.g. *Eucalyptus coccifera, Eucalyptus subcrenulata*, and *Eucalyptus delegatensis* etc). This general simplification, which has been applied to all completed vegetation mapping in the World Heritage Area, provides a more practical and useful tool for managers.

Information from vegetation maps can also be used to generate specific interest maps that can inform and guide management decisions. The following maps provide examples of management applications that have been made of the information provided by vegetation mapping.

Source: Sib Corbett, Resource Management and Conservation, DPIWE

Rainforest and Rainforest Shrubberies
- Rainforest
- Wet forest shrubbery

Wet Moorland
- *Sphagnum*

Moorland
- Eastern buttongrass

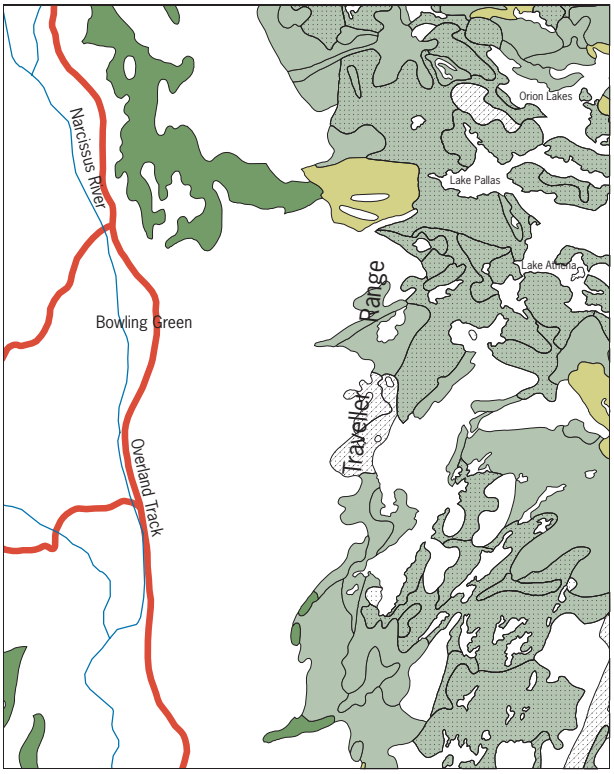
Subalpine and Lowland Vegetation
- Heath
- Tall wet heath

Alpine Vegetation
- Deciduous beech shrubbery
- Alpine and subalpine sedgeland, fernfield
- Coniferous heath
- Alpine grassland and grassy herbfields
- Shrubby alpine heaths

Eucalypt Canopy
- *Eucalyptus coccifera* group
- *Eucalyptus subcrenulata* group
- *Eucalyptus delegatensis* group
- *Eucalyptus nitida* group

Small Trees
- Dead pencil pine
- King Billy pine
- Pencil pine scattered trees

Non Vegetation
- Water



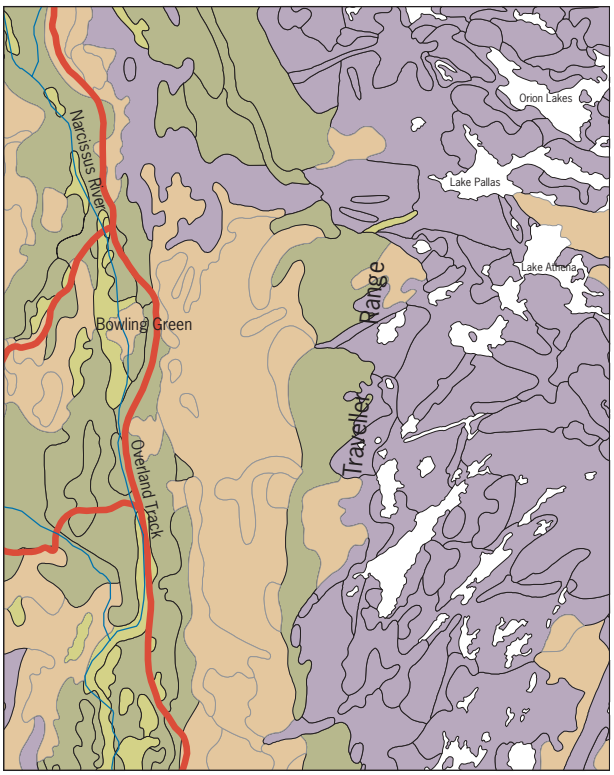
King Billy Pine in Rainforest
Pencil Pines
Dwarf Pines, Coniferous Heath without Pencil Pines
Deciduous Beech
Dead or fire-damaged Pencil Pines

(c) Communities of High Conservation Value

The information from vegetation maps can be used to show where particular plant communities of high conservation values are located. In this example, communities that contain endemic conifers and/or deciduous beech are shown. Both these communities are extremely vulnerable to fire. Sequential aerial photographs can also be used to monitor changes in the area and distribution of communities over time.
Source: Sib Corbett, Resource Management and Conservation, DPIWE

(d) Fire Sensitivity

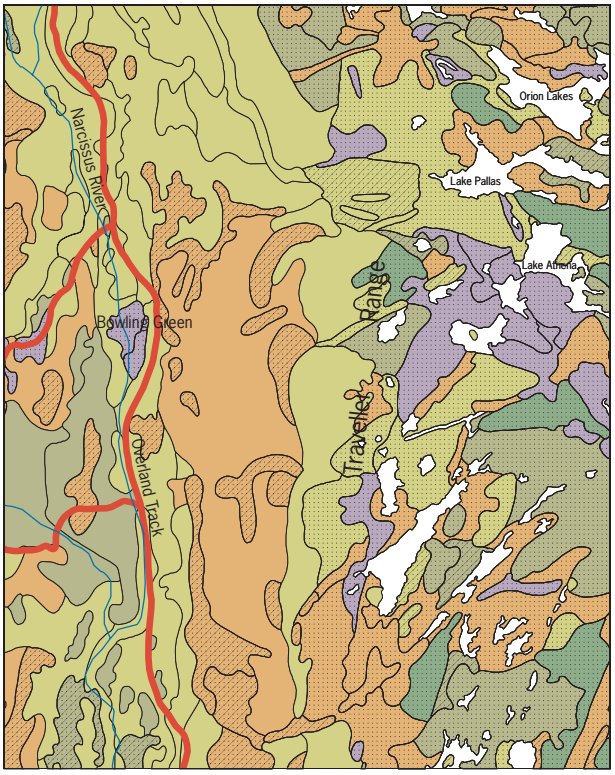
In this example, the information from vegetation maps has been manipulated to plot the relative sensitivities of different plant communities to fire, particularly in relation to their ability to recover following fire.
Source: Jon Marsden-Smedley, PWS Fire Management Section



Fire Sensitivity
Very High
High
Medium
Low

(e) Areas at Risk from Trampling Damage

In this example, the sensitivity of plant species to trampling damage by walkers is shown together with the location of areas most likely to be accessed by walkers. Together, this information identifies areas potentially at risk from trampling damage. This information assists in guiding management decisions in relation to the location of walking tracks and levels of recreational usage.
Source: Sib Corbett, Resource Management and Conservation, DPIWE



Sensitivity to Damange from Trampling
Very High
High (Open wet areas)
Moderate (Wet areas, soft ground layer in rainforest)
Low (Robust Vegetation)
Very Low (Robust vegetation, rocky)

Likelihood of Trampling
Moderate (Attractive open areas off track)
Low (Moderate slopes, scrubby or rainforest)
Very Low (Steep slopes, thick bush)

3.3 Knowledge of the natural and cultural values

3.3.1 Knowledge of natural values

Taxonomic and other knowledge of the flora and fauna of the TWWHA increased substantially over the 1992–1999 period. Surveys by specialists, researchers and post-graduate students (variously coordinated by DPIWE, University of Tasmania, TAFI, CSIRO, and others) led to the discovery of many plant and invertebrate animal species formerly not known to occur within the TWWHA, including the benthic communities of Bathurst Harbour (Barrett et al, 1998). There was also an increase in knowledge of bryophytes and lichens, although knowledge of these groups remains very limited. A fern atlas was produced (Garrett, 1996) and a census of marine algae was prepared (Sanderson & Balmer, 2001).

An increase in knowledge about the distribution and abundance of several animal species listed under the Tasmanian *Threatened Species Protection Act 1995* led to them being de-listed or downgraded, including the pencil pine moth (see Section 5.7.4), the blind cave beetle (see Section 5.7.5), and the Mole Creek cave beetle.

Understanding of natural karst processes in Southwest Tasmania advanced through inventory, and through monitoring of karst water quality and landforms at Ida Bay. Research on buttongrass moorland fire dynamics increased the level of knowledge for carrying out habitat-management burning programs in button grass moorlands.

3.3.2 Knowledge of Aboriginal sites and values

Surveys for Aboriginal sites increased the level of knowledge about the suite of Aboriginal cultural values associated with the TWWHA. Survey areas included: Macquarie Harbour northern shore, the southeast coast, the south coast, Port Davey and Bathurst Harbour, the inland southwest, the southwest coast, the Central Plateau and Walls of Jerusalem. All sites were recorded and registered in the Tasmanian Aboriginal Site Index (TASI) and the findings of the surveys documented in reports (see 'References and Further Information' at the end of this report).

In addition, a number of regional and local surveys for Aboriginal sites (e.g. the Tana Trawna survey of the Central Plateau) contributed to knowledge of the distribution and condition of Aboriginal heritage sites, and hence to the capacity of the managing agency to provide appropriate protection for these sites.

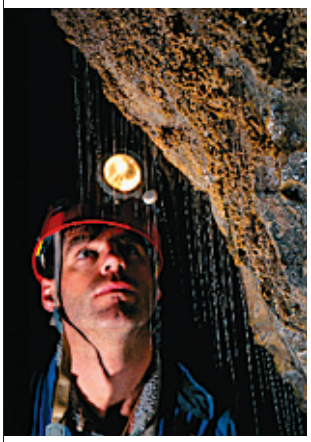
3.3.3 Knowledge of historic sites and values

A number of regional and thematic surveys contributed to knowledge of the distribution and condition of historic sites and features associated with the TWWHA. These mostly related to various former primary production activities (including whaling, pining, mining, hunting, farming, hydro-electric power generation etc) and their associated settlements and infrastructure. This knowledge has in turn contributed to the capacity of the managing agency to provide appropriate maintenance and protection of historic heritage.

Surveys also identified and documented previously unknown historic sites and features including a detailed inventory of historic huts, fencelines and other features on the Central Plateau.

Dr **Steven Smith** was the World Heritage Area Zoologist during the early years of management for the TWWHA. Steve played a key role in developing the fauna research program for the department including establishing the Directed Wildlife Research program. Steve is now Manager of DPIWE's Private Forest Reserve Program.
Photo by Dan Ralph

Jayne Balmer, surveying the effects of fire on buttongrass moorlands, Cardigan Flats, Wild Rivers National Park. Jayne has been a botanist for the TWWHA since the program commenced in 1986, and has been involved in the collection of long term monitoring data on the impacts of fire management, monitoring rare plant populations, studying wet forest fire ecology, and numerous other projects.
Photo by Jon Marsden-Smedley



Stefan Eberhard (Project Officer Cave Fauna) examines glow-worms and their sticky 'fishing lines' that are used to trap insect prey. The Ida Bay cave system supports the largest glowworm display in the Southern Hemisphere and formed part of the nomination for the TWWHA to be listed as a World Heritage Area.
Photo by Stefan Eberhard

3.4 Social and cultural values affecting management

Key Desired Outcome addressed in this section:

KDO 2.2: Identification of social and cultural values, and related management issues, affecting the World Heritage and other natural and cultural values of the TWWHA.

3.4.1 Established (traditional) practices in the TWWHA

Several practices that were undertaken in the TWWHA prior to its listing as a World Heritage Area became questionable once the international conservation aims for the area were recognised. These pre-existing activities included hunting, horseriding, live bait fishing, hut and track construction and maintenance, stock grazing, taking dogs into the area, four wheel drive use, patch burning of areas, and the use of campfires.

A project was commissioned by the managing agency to:

- identify traditional practices in the World Heritage Area;
- develop procedures for assessing their significance;
- evaluate their cultural significance, and
- determine the appropriateness of maintaining those practices in the World Heritage Area.

The report (Knowles, 1997), which was prepared by a consultant social anthropologist, noted that all users of the World Heritage Area could be defined as 'traditional' and that the idea of traditional practice was an evolving concept. Nonetheless, the report suggested that where a practice is spatially specific (ie it cannot occur anywhere else) and where it is part of building community identity and solidarity, the activity should be seen as significant by land managers.

The key recommendations from the report were that traditional practices zones be recognised in the TWWHA; that the managing agency work towards joint management of these areas with local communities; and that communication channels between local communities, user groups and the managing agency should be improved. These recommendations have been addressed in the 1999 TWWHA management plan.

3.4.2 Aboriginal values associated with the TWWHA

Over the 1992–1999 management period, the focus of investigations on Aboriginal heritage shifted from archaeological investigations to Aboriginal community interests in the cultural resources contained in the TWWHA, and Aboriginal cultural landscapes. As a result of working with Aboriginal community organisations, particularly the Tasmanian Aboriginal Land Council (TALC), Aboriginal cultural heritage is increasingly being recognised as being much broader than just 'sites'. Additional considerations regarding Aboriginal values include the use and management of plants, animals and other resources, and commitment to the land, and the rights and obligations of the Aboriginal people to care for and manage their heritage.

A major project between the managing agency and the Aboriginal community (the 'Aboriginal Management in the World Heritage Area' project) led to the development of a section in the 1999 TWWHA management plan dealing specifically with Aboriginal Management.

3.5 Adequacy of knowledge for sound management

Key Desired Outcome addressed in this section:

KDO 2.3: Adequate knowledge of the World Heritage and other natural and cultural values of the TWWHA and related management issues to provide a sound basis for management.

Whilst the level of knowledge required for sound management of the natural and cultural heritage of the TWWHA is considered by the managing agency to be generally adequate in most respects, staff with specialist expertise in various fields considered that a lack of knowledge in the following areas was limiting or hampering sound management of the TWWHA:

- Knowledge of fire regimes and their ecological impacts on communities, particularly the effect of fire age on faunal and floral diversity. This information is considered to be of the most critical importance to management of the TWWHA by specialists in flora and fire management.
- Understanding of the long-term impacts of plant diseases such as the root rot disease *Phytophthora cinnamomi* e.g. on floristics and structure of plant communities, which has implications for the management of the spread of this serious disease.
- Knowledge of visitor impacts and visitor management.
- An appropriate methodology for monitoring subtle changes in wilderness quality in high quality wilderness areas.
- Basic knowledge about the location and nature of geoconservation values across the TWWHA.
- Basic knowledge of the non-vascular flora and invertebrate fauna of the TWWHA and their management requirements.
- Understanding of the management requirements of rare plants and animals.
- Understanding of biophysical processes affecting peatlands; karst systems (e.g. at Marakoopa and Ida Bay); and river and lake systems (e.g. the effects of regulation of river flows by hydroelectric generation operations).
- Understanding of Aboriginal values attached to the TWWHA.

Note that in recent years, significant research effort has commenced on several of these identified priority areas, including fire research and identification of Aboriginal values attached to the TWWHA.